INDEX

A

A portable, discrete-sampling submersible plankton pump and its use in sampling starfish eggs, 168
A substance inducing the loss of premature embryos from ovigerous crabs, 81
ABRAHAM, V. C., see R. A. Fluck, 254
Acanthaster, 139, 153
Acanthaster planci, 17, 90, 168
Adhesive protein, 349
Agaricia humilis, 172
Aggregation, 247
Agnathan, 101
Algal symbiosis in *Bunodeopsis:* sea anemones with "auxiliary" structures, 182
Annual cycle, 271
Antennal gland, 342
Anthopleura elegantissima, 195
Ascidian, 247
Asexual, 62
ASHWORTH, IAN, see Craig Mundy, 168
Aspects of histocompatability and regeneration in the solitary reef coral *Fungia scutaria,* 72
Asteroids, 90
AUSIO, JUAN, see Núria Saperas, 101
AYUKAI, TENSHI, Ingestion of ultraplankton by the planktonic larvae of the crown-of-thorns starfish, *Acanthaster planci,* 90
AZUMI, KAORU, see Hiroki Takahashi, 247

B

BABCOCK, R. C., C. N. MUNDY, and D. WHITEHEAD, Sperm diffusion models and *in situ* confirmation of long-distance fertilization in the free-spawning asteroid *Acanthaster planci,* 17
BABCOCK, RUSS, see Craig Mundy, 168
Bacteria, 90
Behavior, 328
BENZIE, J. A. H., and P. DIXON, The effects of sperm concentration, sperm:egg ratio, and gamete age on fertilization success in crown-of-thorns starfish (*Acanthaster planci*) in the laboratory, 139
BENZIE, J. A. H., K. P. BLACK, P. J. MORAN, and P. DIXON, Small-scale dispersion of eggs and sperm of the crown-of-thorns starfish (*Acanthaster planci*) in a shallow coral reef habitat, 153
BIGGER, CHARLES H., see Paul L. Jokiel, 72
Bioassay, 319
Biodynamics, 221
Biological characteristics and biomedical applications of the squid *Sepioteuthis lessoniana* cultured through multiple generations, 328
Biologically active peptide, 247
Biomedical research, 328
BISHOP, J. MICHAEL, Misguided cells: the genesis of human cancer, 1
Bivalves, 221
BLACK, K. P., see J. A. H. Benzie, 153
BORST, DAVID W., BRIAN TSUKIMURA, HANS LAUFER, and ERNEST F. COUCH, Regional differences in methyl farnesoate production by the lobster mandibular organ, 9
BOUARICHA, N., M. CHARMANTIER-DAURES, P. THUET, J.-P. TRILLES, and G. CHARMANTIER, Ontogeny of omoregulatory structures in the shrimp *Penaeus japonicus* (Crustacea: Decapoda), 29

C

Calcium buffer injections inhibit ooplasmic segregation in medaka eggs, 254
Calcium gradient, 254
Cancer, 1
  genes, 1
CARROLL, DAVID J., and STEPHEN C. KEMPF, Changes occur in the central nervous system of the nudibranch *Berghia verrucicornis* (Mollusca, Opisthobranchia) during metamorphosis, 202
Cell theory, 1
Cells, 1
Cephalochordate, 101
Changes occur in the central nervous system of the nudibranch *Berghia verrucicornis* (Mollusca, Opisthobranchia) during metamorphosis, 202
CHARMANTIER, G., see N. Bouaricha, 29
CHARMANTIER-DAURES, M., see N. Bouaricha, 29
Chemosensory, 172
CHIVA, MANEL, see Núria Saperas, 101
CHOI, KWANG-SIK, ERIC N. POWELL, DONALD H. LEWIS, and SAMMY M. RAY, Instantaneous reproductive effort in female American oysters, *Crassostrea virginica,* measured by a new immunoprecipitation assay, 41
Chromosomal proteins of the sperm of a cephalochordate (*Branchiostoma floridae*) and an agnathan (*Petromyson marinus*): compositional variability of the nuclear sperm proteins of deuterostomes, 101
Circulation, 124
Claw asymmetry, 241
Conducting systems in sea anemones, 195
Cooling, 319
Cooling-induced activation of the pericardial organs of the spiny lobster, *Panulirus japonicus,* 319
Coral, 72, 172
Coral reef faunas, 139, 153
Cost of breathing, 213
COUCH, ERNEST F., see David W. Borst, 9
Crab, 81, 342
Crassostrea, 41
Crassostrea virginica, 221
Crustacea, 319

D

DAY, REBECCA J., Algal symbiosis in *Bunodeopsis:* sea anemones with "auxiliary" structures, 182
DE VRIES, M. C., D. L. WOLCOTT, and C. W. HOLLIDAY, High ammonia and low pH in urine of the ghost crab, *Ocypode quadrata,* 342
Decapeptide, 349
DEJOURS, PIERRE, see André Toulmond, 213
Dendraster excentricus, 291
Deposit-feeder, 213
Development, 62
Diffusion models, 17
DIXON, P., see J. A. H. Benzie, 139, 153
DOWSE, HOWARD B., see Sara J. Sawyer, 195

INDEX

A

A portable, discrete-sampling submersible plankton pump and its use in sampling starfish eggs, 168
A substance inducing the loss of premature embryos from ovigerous crabs, 81
ABRAHAM, V. C., see R. A. Fluck, 254
Acanthaster, 139, 153
Acanthaster planci, 17, 90, 168
Adhesive protein, 349
Agaricia humilis, 172
Aggregation, 247
Agnathan, 101
Algal symbiosis in *Bunodeopsis:* sea anemones with "auxiliary" structures, 182
Annual cycle, 271
Antennal gland, 342
Anthopleura elegantissima, 195
Ascidian, 247
Asexual, 62
ASHWORTH, IAN, see Craig Mundy, 168
Aspects of histocompatability and regeneration in the solitary reef coral *Fungia scutaria,* 72
Asteroids, 90
AUSIO, JUAN, see Núria Saperas, 101
AYUKAI, TENSHI, Ingestion of ultraplankton by the planktonic larvae of the crown-of-thorns starfish, *Acanthaster planci,* 90
AZUMI, KAORU, see Hiroki Takahashi, 247

B

BABCOCK, R. C., C. N. MUNDY, and D. WHITEHEAD, Sperm diffusion models and *in situ* confirmation of long-distance fertilization in the free-spawning asteroid *Acanthaster planci,* 17
BABCOCK, RUSS, see Craig Mundy, 168
Bacteria, 90
Behavior, 328
BENZIE, J. A. H., and P. DIXON, The effects of sperm concentration, sperm:egg ratio, and gamete age on fertilization success in crown-of-thorns starfish (*Acanthaster planci*) in the laboratory, 139
BENZIE, J. A. H., K. P. BLACK, P. J. MORAN, and P. DIXON, Small-scale dispersion of eggs and sperm of the crown-of-thorns starfish (*Acanthaster planci*) in a shallow coral reef habitat, 153
BIGGER, CHARLES H., see Paul L. Jokiel, 72
Bioassay, 319
Biodynamics, 221
Biological characteristics and biomedical applications of the squid *Sepioteuthis lessoniana* cultured through multiple generations, 328
Biologically active peptide, 247
Biomedical research, 328
BISHOP, J. MICHAEL, Misguided cells: the genesis of human cancer, 1
Bivalves, 221
BLACK, K. P., see J. A. H. Benzie, 153
BORST, DAVID W., BRIAN TSUKIMURA, HANS LAUFER, and ERNEST F. COUCH, Regional differences in methyl farnesoate production by the lobster mandibular organ, 9
BOUARICHA, N., M. CHARMANTIER-DAURES, P. THUET, J.-P. TRILLES, and G. CHARMANTIER, Ontogeny of omoregulatory structures in the shrimp *Penaeus japonicus* (Crustacea: Decapoda), 29

C

Calcium buffer injections inhibit ooplasmic segregation in medaka eggs, 254
Calcium gradient, 254
Cancer, 1
  genes, 1
CARROLL, DAVID J., and STEPHEN C. KEMPF, Changes occur in the central nervous system of the nudibranch *Berghia verrucicornis* (Mollusca, Opisthobranchia) during metamorphosis, 202
Cell theory, 1
Cells, 1
Cephalochordate, 101
Changes occur in the central nervous system of the nudibranch *Berghia verrucicornis* (Mollusca, Opisthobranchia) during metamorphosis, 202
CHARMANTIER, G., see N. Bouaricha, 29
CHARMANTIER-DAURES, M., see N. Bouaricha, 29
Chemosensory, 172
CHIVA, MANEL, see Núria Saperas, 101
CHOI, KWANG-SIK, ERIC N. POWELL, DONALD H. LEWIS, and SAMMY M. RAY, Instantaneous reproductive effort in female American oysters, *Crassostrea virginica,* measured by a new immunoprecipitation assay, 41
Chromosomal proteins of the sperm of a cephalochordate (*Branchiostoma floridae*) and an agnathan (*Petromyson marinus*): compositional variability of the nuclear sperm proteins of deuterostomes, 101
Circulation, 124
Claw asymmetry, 241
Conducting systems in sea anemones, 195
Cooling, 319
Cooling-induced activation of the pericardial organs of the spiny lobster, *Panulirus japonicus,* 319
Coral, 72, 172
Coral reef faunas, 139, 153
Cost of breathing, 213
COUCH, ERNEST F., see David W. Borst, 9
Crab, 81, 342
Crassostrea, 41
Crassostrea virginica, 221
Crustacea, 319

D

DAY, REBECCA J., Algal symbiosis in *Bunodeopsis:* sea anemones with "auxiliary" structures, 182
DE VRIES, M. C., D. L. WOLCOTT, and C. W. HOLLIDAY, High ammonia and low pH in urine of the ghost crab, *Ocypode quadrata,* 342
Decapeptide, 349
DEJOURS, PIERRE, see André Toulmond, 213
Dendraster excentricus, 291
Deposit-feeder, 213
Development, 62
Diffusion models, 17
DIXON, P., see J. A. H. Benzie, 139, 153
DOWSE, HOWARD B., see Sara J. Sawyer, 195

E

Echinoderm reproduction, 139
Echinoderms, 62, 291
Echinoids, 291
Ecology, 62
Endocrine control of oocyte maturation and spawning, 263
Endogenous substrates for energy metabolism in spermatozoa of the sea urchins *Arbacia lixula* and *Paracentrotus lividus*, 285
Endoscope, 221
Energetics of the ventilatory piston pump of the lugworm, a deposit-feeding polychaete living in a burrow, 213
Energy metabolism, 285
Epipodites, 29
Excitatory actions of FMRFamide-related peptides (FaRPs) on the neurogenic *Limulus* heart, 309

F

Factors affecting fertilization success, 139
Feeding, 90
Fertilization, 17, 139, 153, 168
  rates, 17, 168
Fish development, 254
FLUCK, R. A., A. L. MILLER, V. C. ABRAHAM, and L. F. JAFFE, Calcium buffer injections inhibit ooplasmic segregation in medaka eggs, 254
Fluid transport system, 124
Flypaper, 172
FREEMAN, GARY, The endocrine pathway responsible for oocyte maturation in the inarticulate brachiopod *Glottidia*, 263
Functional consequences of phenotypic plasticity in echinoid larvae, 291
Fundulus, 271

G

Ganglia, 202
Gills, 29
GOLZ, RAINER, Occurrence and distribution of RFamide-positive neurons within the polyps of *Coryne* sp. (Hydrozoa, Corynide), 115
GOVIND, C. K., and A. T. READ, Regenerate limb bud sufficient for claw reversal in adult snapping shrimps, 241
Graft, 72
GREELEY, MARK S., Jr., see Shyh-Min Hsiao, 271
GREENBERG, MICHAEL J., *The Biological Bulletin*–Marine Models Electronic Record (BB-MMER): an electronic companion to *The Biological Bulletin*, 137
GROOME, JAMES R., MARK A. TOWNLEY, and WINSOR H. WATSON, Excitatory actions of FMRFamide-related peptides (FaRPs) on the neurogenic *Limulus* heart, 309

H

HANLON, ROGER T., see Phillip G. Lee, 328
HART, MICHAEL W., and RICHARD R. STRATHMANN, Functional consequences of phenotypic plasticity in echinoid larvae, 291
Hatch water, 81
Heart, 319
Hemigrapsus sanguineus, 300
Hemocyte, 247
Hemocyte aggregation in the solitary ascidian *Halocynthia roretzi*: plasma factors, magnesium ion, and Met-Lys-bradykinin induce the aggregation, 247
High ammonia and low pH in urine of the ghost crab, *Ocypode quadrata*, 342
Histocompatability, 72
HOLLIDAY, C. W., see M. C. De Vries, 342
Homarus americanus, 9
HOOKER, NEAL, see Daniel E. Morse, 172
Horseshoe crab, 309
HSIAO, SHYH-MIN, MARK S. GREELEY Jr., and ROBIN A. WALLACE, Reproductive cycling in female *Fundulus heteroclitus*, 271
Hydrodynamic dispersion of gametes, 153
Hydrolithon boergesenii, 172
Hydrothermal vents, 134
Hydrozoa, 115

I

Immunoassay, 41
In situ spawning of hydrothermal vent tubeworms (*Riftia pachyptila*), 134
In vivo studies of suspension-feeding processes in the eastern oyster, *Crassostrea virginica* (Gmelin), 221
Inducer, 172
Ingestion of ultraplankton by the planktonic larvae of the crown-of-thorns starfish, *Acanthaster planci*, 90
INOUE, KOJI, and SATOSHI ODO, The adhesive protein cDNA of *Mytilis galloprovincialis* encodes decapeptide repeats but no hexapeptide motif, 349
Instantaneous reproductive effort in female American oysters, *Crassostrea virginica*, measured by a new immunoprecipitation assay, 41

J

JAECKLE, WILLIAM B., Multiple modes of asexual reproduction by tropical and subtropical sea star larvae: an unusual adaptation for genet dispersal and survival, 62
JAFFE, L. F., see R. A. Fluck, 254
JOKIEL, PAUL L., and CHARLES H. BIGGER, Aspects of histocompatability and regeneration in the solitary reef coral *Fungia scutaria*, 72

K

KASINSKY, HAROLD E., see Núria Saperas, 101
KEMPF, STEPHEN C., see David J. Carroll, 202
KIKUYAMA, SAKAE, see Masatoshi Mita, 285
KURAMOTO, TAKETERU, and MASAKI TANI, Cooling-induced activation of the pericardial organs of the spiny lobster, *Panulirus japonicus*, 319

L

LABARBERA, MICHAEL, see David Marcinek, 124
Laboratory studies on molting and growth of the shore crab, *Hemigrapsus sanguineus* de Haan, parasitized by a rhizocephalan barnacle, 300
Larvae, 62, 172, 202
Larval feeding, 291
LAUFER, HANS, see David W. Borst, 9
LEE, PHILLIP G., PHILIP E. TURK, WON TACK YANG, and ROGER T. HANLON, Biological characteristics and biomedical applications of the squid *Sepioteuthis lessoniana* cultured through multiple generations, 328
LEWIS, DONALD H., see Kwang-Sik Choi, 41
Limulus neuropeptides, 309
Lobster, 9, 319
Lugworm, 213
Lunar cycle, 271

M

MACDONALD, BRUCE A., see J. Evan Ward, 221
Mandibular organ, 9
MARCINEK, DAVID, and MICHAEL LABARBERA, Quantitative branching geometry of the vascular system of the blue crab, *Callinectes sapidus* sp. (Arthropoda, Crustacea): a test of Murray's Law in an open circulatory system, 124
Mariculture, 328
Marine invertebrate reproduction, 139, 153
MATSUURA, SHUHEI, see Tohru Takahashi, 300
Mechanical work of ventilation, 213
Metamorphosis, 172, 202

Methyl farnesoate, 9
MILLER, A. L., see R. A. Fluck, 254
Misguided cells: the genesis of human cancer, 1
MITA, MASATOSHI, ATSUKO OGUCHI, SAKAE KIKUYAMA, IKUO YASUMASU, ROSARIO DE SANTIS, and MASARU NAKAMURA, Endogenous substrates for energy metabolism in spermatozoa of the sea urchins *Arbacia lixula* and *Paracentrotus lividus*, 285
Mollusks, 221
  juvenile, 202
MORAN, P. J., see J. A. H. Benzie, 153
Morphogen, 172
Morphogen-based chemical flypaper for *Agaricia humilis* coral larvae, 172
MORSE, AILEEN N. C., see Daniel E. Morse, 172
MORSE, DANIEL E., AILEEN N. C. MORSE, PETER T. RAIMONDI, and NEAL HOOKER, Morphogen-based chemical flypaper for *Agaricia humilis* coral larvae, 172
Mucus, 221
Multiple modes of asexual reproduction by tropical and subtropical sea star larvae: an unusual adaptation for genet dispersal and survival, 62
MUNDY, C. N., see R. C. Babcock, 17
MUNDY, CRAIG, RUSS BABCOCK, IAN ASHWORTH, and JOHN SMALL, A portable, discrete-sampling submersible plankton pump and its use in sampling starfish eggs, 168
Mussel, 349
Mytilis, 349

N

NAKAMURA, MASARU, see Masatoshi Mita, 285
Natural fertilization rates, 17
Nervous system, 115
Neurodevelopment, 202
Neurophysiological correlates of the behavioral response to light in the sea anemone *Anthopleura elegantissima*, 195
Neuroscience, 328
Neurosecretion, 319
NEWELL, ROGER I. E., see J. Evan Ward, 221
Nitrogen excretion, 342
Nuclear sperm proteins, 101
Nudibranchia, 202

O

Occurrence and distribution of RFamide-positive neurons within the polyps of *Coryne* sp. (Hydrozoa, Corynidae), 115
Octopamine, 319
ODO, SATOSHI, see Koji Inoue, 349
OGUSHI, ATSUKO, see Masatoshi Mita, 285
Oncogenes, 1
Ontogeny, 29
Ontogeny of omoregulatory structures in the shrimp *Penaeus japonicus* (Crustacea: Decapoda), 29
Oocyte maturation and spawning, 263
Optimality, 124
Oryzias latipes, 254
Osmoregulation, 29
Ovary, 271
Ovigerous female, 81
Oyster, 41, 221

P

Penaeids, 29
Penaeus japonicus, 29
Pericardial organ, 319
Perkinsus, 41
Phenotypic plasticity, 291
Phospholipid, 285
Photoreception, 195
Piston-pump breather, 213
Plankton pump, 168
  sampling, 168
POWELL, ERIC N., see Kwang-Sik Choi, 41

Q

Quantitative branching geometry of the vascular system of the blue crab, *Callinectes sapidus* sp. (Arthropoda, Crustacea): a test of Murray's Law in an open circulatory sytems, 124

R

RAIMONDI, PETER T., see Daniel E. Morse, 172
RAY, SAMMY M., see Kwang-Sik Choi, 41
READ, A. T., see C. K. Govind, 241
Recognition, 172
Recruitment, 172
Regenerate limb bud sufficient for claw reversal in adult snapping shrimps, 241
Regeneration, 72, 241
  of externa, 300
Regional differences in methyl farnesoate production by the lobster mandibular organ, 9
Reproduction, 41, 62, 271
Reproductive cycling in female *Fundulus heteroclitus*, 271
Reproductive success, 139, 153
Resumption of molting, 300
RFamide, 115
Rhizocephala, 300
RIBES, ENRIC, see Núria Saperas, 101
Role of 3′5′ cyclic monophosphate, 263
ROSENBERG, ELLEN, see Núria Saperas, 101

S

Sacculina senta, 300
SAIGUSA, MASAYUKI, A substance inducing the loss of premature embryos from ovigerous crabs, 81
DE SANTIS, ROSARIO, see Masatoshi Mita
SAPERAS, NÚRIA, MANEL CHIVA, ENRIC RIBES, HAROLD E. KASINSKY, ELLEN ROSENBERG, JOHN H. YOUSON, and JUAN AUSIO, Chromosomal proteins of the sperm of a cephalochordate (*Branchiostoma floridae*) and an agnathan (*Petromyson marinus*): compositional variability of the nuclear sperm proteins of deuterostomes, 101
SAWYER, SARA J., HAROLD B. DOWSE, and J. MALCOLM SHICK, Neurophysiological correlates of the behavioral response to light in the sea anemone *Anthopleura elegantissima*, 195
Sea anemones, 182
Sea urchin spermatozoa, 285
Semilunar cycle, 271
Serotonin, 319
Shear stress, 124
SHICK, J. MALCOLM, see Sara J. Sawyer, 195
SMALL, JOHN, see Craig Mundy, 168
Small-scale dispersion of eggs and sperm of the crown-of-thorns starfish (*Acanthaster planci*) in a shallow coral reef habitat, 153
Snapping shrimps, 241
Spawning, 134, 168, 271
  behavior, 17
Sperm diffusion, 17
Sperm diffusion models and *in situ* confirmation of long-distance fertilization in the free-spawning asteroid *Acanthaster planci*, 17
Squid, 328
STRATHMANN, RICHARD R., see Michael W. Hart, 291
Substance causing a detachment of premature embryos, 81
Suspension-feeding, 221, 291
Symbiosis, 182

T

TAKAHASHI, HIROKI, KAORU AZUMI, and HIDEYOSHI YOKOSAWA, Hemocyte aggregation in the solitary ascidian *Halocynthia roretzi:* plasma factors, magnesium ion, and Met-Lys-bradykinin induce the aggregation, 247
TAKAHASHI, TOHRU, and SHUHEI MATSUURA, Laboratory studies on molting and growth of the shore crab, *Hemigrapsus sanguineus* de Haan, parasitized by a rhizocephalan barnacle, 300
TANI, MASAKI, see Taketeru Kuramoto, 319
Temperature, 319
The adhesive protein cDNA of *Mytilis galloprovincialis* encodes decapeptide repeats but no hexapeptide motif, 349
The Biological Bulletin–Marine Models Electronic Record (BB-MMER): an electronic companion to *The Biological Bulletin,* 137
The effects of sperm concentration, sperm:egg ratio, and gamete age on fertilization success in crown-of-thorns starfish (*Acanthaster planci*) in the laboratory, 139
The endocrine pathway responsible for oocyte maturation in the inarticulate brachiopod *Glottidia,* 263
THOMPSON, RAYMOND J., see J. Evan Ward, 221
THUET, P., see N. Bouaricha, 29
Tidal cycle, 271
TOULMOND, ANDRÉ, and PIERRE DEJOURS, Energetics of the ventilatory piston pump of the lugworm, a deposit-feeding polychaete living in a burrow, 213
TOWNLEY, MARK A., see James R. Groome, 309
Triglyceride, 285
TRILLES, J.-P., see N. Bouaricha, 29
TSUKIMURA, BRIAN, see David W. Borst, 9
Tubeworms, 134
TURK, PHILIP E., see Phillip G. Lee, 328

U

Ultraplankton, 90
Urine, 342

V

VAN DOVER, CINDY LEE, *In situ* spawning of hydrothermal vent tubeworms (*Riftia pachyptila*), 134
Ventilation, 213
Vestimentifera, 134

W

WALLACE, ROBIN A., see Shyh-Min Hsiao, 271
WARD, J. EVAN, ROGER I. E. NEWELL, RAYMOND J. THOMPSON, and BRUCE A. MACDONALD, *In vivo* studies of suspension-feeding processes in the eastern oyster, *Crassostrea virginia* (Gmelin), 221
WATSON, WINSOR H., see James R. Groome, 309
WHITEHEAD, D., see R. C. Babcock, 17
WOLCOTT, D. L., see M. C. De Vries, 342

Y

YANG, WON TACK, see Phillip G. Lee, 328
YASUMASU, IKUO, see Masatoshi Mita, 285
YOKOSAWA, HIDEYOSHI, see Hiroki Takahashi, 247
YOUSON, JOHN H., see Núria Saperas, 101

Z

Zooxanthellae, 182